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tistical proofs of the quantity theory by Professors Kemmerer and Fisher. Comparing the index numbers of prices given by their equations of exchange and the corresponding index numbers as directly determined, Dr. Magee finds a correspondence of +.48 in Kemmerer's series for 1879-1908, and of +.31 in Fisher's series for 1896-1909.

Of course this method of determining the agreement between two series is extremely rough, since attention is given only to the direction of the fluctuations. In dealing with Fisher's and Kemmerer's figures, accordingly, Dr. Magee refines upon his procedure by taking into account not only the direction but also the degree of change from one year to the next. To this end he computes the percentage of increase or decrease between the successive numbers in each of the series to be compared, divides the smaller by the larger, and strikes the arithmetic mean of the quotients. That this method gives erratic and therefore unreliable results has been demonstrated by Professor W. M. Persons in the March issue of the *Quarterly Publications of the American Statistical Association*. Hence little importance attaches to the final unfavorable results which Dr. Magee obtains from his testing of Fisher's and Kemmerer's work. Better methods of measuring correlation, even where the time element is important, have been devised and described in textbooks like Yule's.

It is unfortunate that such an energetic and capable young investigator as Dr. Magee was not given more expert technical advice by those who supervised his dissertation.

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Gold, Prices and Wages. By JOHN A. HOBSON. (London: Methuen and Company; New York: George H. Doran Company. 1913. Pp. xi, 181. \$1.25.)

Essentially, this is an examination of the quantity theory as set forth in various recent works—in particular Fisher's *Purchasing Power of Money*. Fisher's use of the equation of exchange ($MV + M'V' = PT$) is criticised at the point which many readers have felt to be a questionable link in the chain of reasoning—namely, that increases of money (M) bring about proportionate increases in bank deposits (M').

Hobson sees clearly that if Fisher's argument fails at this point his contention as to the effect of gold output on prices loses most

of its force. But though he renders a real service in subjecting this contention to re-examination, his own attempt to refute it fails of its goal for the twofold reason that he is (apparently) not familiar with the whole of Fisher's argument, and that he fails to grasp Fisher's method of analysis. The latter holds that M and M' vary together and that their variations do not affect V or V' . It follows that (if V and V' are not influenced by other forces) the doubling of M will double the whole lefthand member of the equation. General prices (P) will necessarily be doubled as a result. (Assuming T a constant.) Hobson does not understand the mathematics (mere algebra) of treating V and V' as independent of changes in M and M' . Witness the following (p. 146) :

It is surely to be expected that in order to prove that quantity of gold normally rules prices, Professor Fisher would feel obliged to show that the aggregate of money in our sense of money payments (Hobson means by this latter term total "moneywork"—*viz.*, Fisher's $MV + M'V'$) was directly governed by quantity of gold. In order to show this, it is necessary, first, to insist that deposits or circulating credit, is governed by gold; secondly, that the rates of circulation both of gold and of deposits or cheques are similarly governed.

This "secondly" contains Hobson's error in algebra. If V and V' are functions of M , changes in M will *not* produce proportionate changes in P .

But this quotation shows one thing more. Hobson apparently does not understand the scientific method of *isolating* a cause in order to ascertain its effects. Fisher recognizes explicitly (p. 162) that "changes in population, commerce, habits of business men, and banking facilities and laws may produce great changes" in the normal ratio between M' and M , and says (p. 163) that one result of such causes will be to increase M' and hence to increase prices. This is exactly the thesis which Hobson expounds at some length, apparently under the belief that Fisher had overlooked it, and had thereby invalidated his position. The truth, of course, is that with entire comprehension of these forces and their effects, Fisher directs his inquiry to the effects of changes in the quantity of money *considered by themselves*. Hobson's refusal to accept conclusions reached by this method (a method invoked by all scientists) is like rejecting the law of gravitation because a balloon rises in the air, or because a falling body is deflected from its path by the force of the wind.

On the same order is the argument that enlarged bank reserves

have not increased bank credit because if it were so the rate of discount must have fallen, whereas on the evidence of statistics it has risen. Hobson thinks the quantity theorist is dependent for the validity of his argument upon the supposed fall in the rate of discount. But no one is more keenly aware of what does happen to discount and interest rates than the author of *Appreciation and Interest* and *The Rate of Interest*; and a knowledge of these writings should have made it clear that bank credit might be extended even with a rate of discount rising *pari passu* with the increase in the general rate of interest which accompanies rising prices.

A truly interesting part of the book is reached in the author's exposition of bank credit as increasingly and almost completely independent of the gold reserve. In his opinion, bank credit is founded on concrete forms of property. The element of truth in this contention would seem to lie in the fact that the liabilities of a bank are *secured* by its assets; that among these assets are the liabilities (*e.g.*, promissory notes) of business men, and that back of these are the general assets of these same men. But this well-known truth is not inconsistent with the other fact that banks find it necessary to relate their reserves to the amount of their demand liabilities. As long as this continues to be the case, there will continue to be a "normal" relation between money and bank credit. The part of the book which is presented as an original constructive contribution to the theory of prices has been reviewed with great particularity and with strongly adverse judgment, by Professor J. M. Keynes in the English *Economic Journal* for September, 1913. In this judgment the present reviewer concurs.

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The Influence of the Gold Supply on Prices and Profits. By Sir DAVID BARBOUR. (London: Macmillan and Company. 1913. Pp. xii, 104. \$1.25.)

Sir David Barbour has in other publications made clear his strong belief in the quantity theory of money, and his further emphasis on that view in this, his latest work, is no surprise. His purpose, as stated in the preface, is "to show in what way the quantity of money affects prices and to explain the limitations involved in the assumption that 'other things are equal'." Ricardo's theory of the distribution of the precious metals is the